

**FINANCING URBAN  
INFRASTRUCTURE IN RUSSIA:  
GUIDELINES FOR MULTI-YEAR  
MUNICIPAL BORROWING**

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## EXECUTIVE SUMMARY

During the transition to a more market-based economy, the traditional funding sources for housing-related infrastructure in Russia are no longer able to meet the growing needs for expanded and upgraded capital plant, new equipment, and improved maintenance. Central government funds for local-level infrastructure capital improvements have virtually disappeared, and local government budgets -- at either oblast or municipal level -- cannot make up the slack during this period of prolonged local fiscal stress. There are expanding requirements for major capital construction on all housing-related infrastructure activities, but neither budgetary sources nor subsidies from higher authorities are sufficient to meet these growing needs. Rather than relying upon inadequate budgetary sources or subsidies, municipalities and other local governments should consider multi-year financing arrangements to pay for major urban infrastructure improvements.

This report explains approaches to, and options for, multi-year financing for municipal infrastructure projects in Russia. It also offers guidelines to municipalities and their municipal enterprises that may wish to consider such financing. The indicated approach is straightforward. Once local officials have selected a specific, well-designed project for multi-year financing, financial analysis can ascertain the financial feasibility of the proposed project. If this analysis shows that sufficient revenues are likely to be forthcoming to repay any needed project loan, appropriate project financing may then be pursued.

Although long-term borrowing is the normal way to finance municipal capital projects in the West, it is a new idea that may not easily be adopted by Russian municipalities. Our work has shown that Russian municipal leaders are reluctant to discard the concept of financing capital improvements solely from current budgetary sources or subsidies from higher authorities. Moreover, the Russian tradition of charging very low tariffs to the population for communal services will also not yield easily to the more economically rational approach of paying for at least some long-term capital improvements through higher customer tariffs.

Accordingly, the financial analyses described in this paper suggest the need for creative local approaches to infrastructure finance. A combination of loan financing, local budgetary contribution, and politically feasible tariff increase may offer a promising solution to a financing requirement that likely could not be met from any one of these sources alone. Any such imaginative ideas, necessarily tailored to individual local circumstances, might sometimes require the constructive collaboration of local leaders from two or even more local jurisdictions -- municipality, raion, and/or oblast. With creative local thinking, realistic financial projections (as outlined here) can point the way toward feasible, competitively-priced multi-year financing of infrastructure improvements -- whether through bank loans, municipal bonds, or even Eurobonds.

## PREFACE

This report was prepared at the close of the 16-month tour of the resident advisor in infrastructure finance, as funded under USAID's Housing Sector Reform Project (HSRP II). HSRP II was contracted to the Urban Institute, and the infrastructure finance resident advisor was subcontracted to Research Triangle Institute. The information contained herein is based primarily upon the working experience of the HSRP infrastructure finance team in five Russian municipalities,<sup>18</sup> and on informative interviews with a half-dozen more.

This report fulfills the requirement in our second-year workplan for a "how to" manual on long-term financing of urban infrastructure projects. This broad perspective on multi-year financing of infrastructure in Russian municipalities follows our more basic September 1996 paper, "Financing Urban Infrastructure in Russia: Practical Approaches to Multi-Year Municipal Borrowing," some of whose material is also contained herein. As a brief statement of our work, the September 1996 paper outlined the major steps for local officials to follow in preparing for multi-year financing.

This present paper includes a more comprehensive discussion of the options for long-term finance. It is intended for use by local officials of Russian municipalities, municipal enterprises, raions, and oblasts. Drawing from the previous paper, it outlines important preparatory activities that should be carried out in advance of any such borrowing. It goes well beyond the earlier paper in providing considerable information on financial analysis itself, and it provides more detailed information on bank, municipal bond, and Eurobond financing. Concrete illustrations are included of financial analyses of prospective infrastructure projects in actual Russian communities. An appendix provides a list of firms that could assist in preparing project packages for financing consideration by banks and bond underwriters.

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<sup>3</sup> Nizhni Novgorod City (in collaboration with Nizhni Novgorod Oblast), the Cities of Vladimir, Ryazan, and Pskov, and Sudogda Raion (in collaboration with Vladimir Oblast). Additional project discussions were held with local officials of the Cities of Moscow and St. Petersburg.

## MAJOR STEPS IN MULTI-YEAR FINANCING OF INFRASTRUCTURE PROJECTS

Several separate steps should be considered by any municipality, municipal enterprise, or oblast that is thinking about multi-year borrowing for infrastructure capital improvements. These activities, if undertaken seriously by a municipality or oblast, should greatly improve the likelihood that the right project may be designed, proposed, and ultimately financed. The following important steps in preparing for and carrying out infrastructure financing will be discussed in the following sections:

**Project specification:** Identifying the particular project to be financed;

**Review of project size and scope:** Seeking an appropriate, affordable project that fits a particular capital development objective;

**Project financial analysis:** Analyzing the project's financial implications for the city and its municipal enterprise -- particularly the cash flow projections that show if debt service payments can be met from available revenues; and

**Project financing:** Selecting the best means of raising the needed capital, based on the nature of the project, the community's financial situation, and other pertinent circumstances.

## PROJECT SPECIFICATION

### Starting with the Right Project

As is true for local governments around the world, financial limitations constrain the ability of most Russian cities, municipal enterprises, and oblasts to undertake needed infrastructure development projects. The required expenditures are substantial for most infrastructure projects, many of which may well not generate enough additional revenues to even begin to repay the needed construction loans. Project loan repayments are often quite substantial, and a city's borrowing effort itself is not insignificant. The ability of most localities to meet the resulting repayment burden is often, therefore, quite limited.

Such financial constraints mean that localities should prioritize their efforts, concentrating on needed high-return projects that they can afford. In general, the first project to be financed should yield the greatest net return; otherwise, financing should be sought for another project offering a higher net return. Such prioritization of projects often requires a different perspective on urban infrastructure development than existed in the past. It also demands a serious approach to borrowing and loan repayment that is new to local governments in Russia.

Project identification should thus not be treated as a trivial matter. Accordingly, the following discussion suggests some approaches to the selection of projects, some of which must rely upon external financing. These ideas center around the concept of the capital improvements program (CIP), which is a regular process of rather rigorously reconsidering the character and priorities of a city's proposed list of future capital projects. While only a cursory treatment of this topic, our discussion advocates a stronger capital planning process than now

seems to exist in most Russian cities.

## **The Context of Project Specification**

The specific project that is targeted for multi-year borrowing should be determined in the larger context of the city's overall capital improvements program (CIP), as discussed below.

From the list of prioritized capital projects, top-ranked projects yielding long-term benefits but requiring several years to complete should be considered for long-term financing, if funding is not available from another source. Those projects that are designated for multi-year financing should be so selected based on the city's anticipated ability to meet the expected debt service payments, be it from city budget revenues, project-generated revenues, or outside subsidies.

Although most Russian municipalities commonly have a "wish list" of projects that they would like to complete, this is not as useful a guide to action as is the capital improvements process outlined below.

Since such potential municipal projects may have been designed some years in the past, they often do not reflect the current realities that have arisen in the transition to a more market-based economy. Changing demographic patterns or industrial conditions may have by-passed the needs that were seen at the time such designs were drawn up. Improving technologies and greatly increased input costs (especially for energy) may well have made older capital technologies obsolete. Emerging market forces may require substantially different capital installations than were envisioned during a previous era. Even a partially-completed project may no longer best serve the public interest -- or be as cost-effective -- as might a newly-designed project that would better reflect today's programmatic and economic realities.

The city's backlog of desirable projects might also not have benefitted from the more rigorous examination of project benefits and costs that is part of the process of annually evaluating and up-dating the municipality's capital improvements program. Even a purely qualitative annual review of prospective capital projects by a regular panel of local officials might well downgrade the priorities of some long-sought projects. In all likelihood, such regular annual reviews of long-term capital needs would also identify newly emerging project requirements that might not have been identified by more informal programming of capital development.

Finally, introduction of a more regular capital programming process would itself likely raise the minimum standards of quantitative evaluation of projects that are eligible for active pursuit by the city. Prioritization of projects based in part (but only in part) on objective criteria of project cost and payoff would generate support for a more analytic approach to capital improvements decision making. While even the most technically sophisticated city hall would not simply turn capital project selection over to the computer, introduction of more quantitative criteria of project selection could surely improve the caliber of the debate in both large and small municipalities.

## **Project Planning Through a Capital Improvements Program**

A capital improvements program (CIP) seeks to rationalize capital improvement planning over several future years by recognizing the totality of a city's capital development needs and the resources that will likely be available to meet those needs. This may include such considerations as the following.

Devise a multi-year capital improvements program for the future development of the city, presented in financially realistic terms that acknowledge the inter-relatedness of various capital projects.

Prioritize these projects in the annual CIP, incorporating any available estimates of quantitative returns of each project in conjunction with qualitative judgments of how each project contributes to the overall capital improvements program. Up-date the CIP annually to reflect changing circumstances.

Match project needs with the resources that are likely to be made available for capital development purposes, thus keeping a financially realistic perspective on the city's longer-term capital planning.

A capital improvements program is unlike the former five-year plans. The capital planning process itself is now essentially local in nature, and the project funding must now be mobilized largely by the municipality itself (although this may well include grant funding from outside sources such as the oblast or even the central government). In that sense, the CIP should include only projects for which financing is realistically likely -- either from current budgets, foreseeable grants or subsidies, or borrowing (with adequate provision of debt service payments). To maintain a sense of reality, it might even be desirable to differentiate projects for which such funding is reasonable well-assured from those for which it is merely possible but less likely.

## **Selecting the Preferred Project(s) for Which Financing is Desired**

The number of high-priority capital projects requiring multi-year loans can greatly exceed a city's ability to service all such loans. As will be noted below, one might well begin with a small, simple project that can form the foundation for larger, more complicated efforts later on.

### *Prioritizing Projects*

Especially at its inception, capital improvement planning in Russian municipalities need not be based on complex or sophisticated quantitative techniques. Although there are various quantitative approaches to capital planning -- including payback period, internal rate of return, cost-benefit ratio, and net present value -- a rational planning process need not rely upon quantitative techniques at the outset. Indeed, quantitative comparisons among alternative



capital improvement projects often lose their significance whenever -- as is often the case -- such factors as popular approval, perceived municipal need, or prospects for outside funding become the decision criteria in project selection.

Even if capital planning decisions may be driven solely by qualitative factors, cash flow analysis should still demonstrate the community's ability to repay any loan that is to be used to finance a given project. As is argued elsewhere in this paper, multi-year borrowing will likely become an increasingly important aspect of municipal finance in Russia, and future multi-year borrowing will depend upon the community's timely repayment of its initial loans. A careful cash flow projection of sufficient revenues to meet these repayment expenditures may thus demonstrate the financial viability of a proposed project.

#### *Public (Not Private) Sector Objectives for Public Sector Projects*

Beyond the questions of prioritizing and valuing projects is the perhaps more fundamental concern about the appropriate fundamental character of public investment projects themselves. This issue emerges from inappropriate attempts by local leaders, seen often in countries making the transition to a market economy, to involve their municipalities in profit-making activities. When such endeavors occur, it is almost as if municipalities themselves were private sector economic actors (seeking to maximize profits in their operations), rather than public sector entities (seeking to provide services to the public that could not properly be provided through the private market). In the form either of municipal lending to profit-making activities or even of municipal equity ownership in private businesses, such public sector involvement in private market activities is almost always an inefficient, unjustifiable, and sometimes irresponsible allocation of public monies to what should be perceived as private purposes.

In one sense, this inappropriate allocation of public monies to private market activities may be seen as a fundamental conflict between a municipality's *objective* in the use of borrowed funds and its *strategy* for doing so.

On the one hand, a municipality's objective should be that of a public sector entity. The city presumably wishes to implement capital projects that will contribute to the development of the city and to the economic well-being of municipal residents and businesses (physical and legal entities). In serving an essentially public sector purpose, such projects would generally seek to provide those services that could not normally be profitably provided, in fair as well as adequate amounts, through the normal operation of the private market. Normally, such public sector projects would be selected from among the prospective capital development projects of the several functional departments of the City (roads and bridges, water and sewer services, health and safety, social services, etc.). As noted above, the possible capital projects could be prioritized for financing by evaluating them against several relevant criteria.<sup>19</sup> Higher-ranked

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<sup>19</sup> These criteria might include fiscal effects (capital costs, additional operating and maintenance costs, anticipated additional revenues, community economic effects (increase in local jobs and incomes, downtown revitalization, contribution to the city's long-term economic growth), health and environmental effects (improved traffic safety, environmental quality, etc.), political feasibility (extent of public support/demand).

projects would then be financed first, to the extent of the availability of funding and the city's ability to repay the ensuing debt obligations on time, given any other existing financial obligations.

On the other hand, a municipality's strategy for use of borrowed funds might seek, inappropriately, to emulate that of a private bank or even a private investor, rather than that of a government entity. A private bank would seek security of principal and profitability of operations, and a private investor would seek high profits and eventual high capital gains. A government, in contrast, should focus on generating long-term public benefits from investments that would not otherwise be made by private investors.

One type of such an inappropriate municipal investment strategy might be the use of proceeds from a municipal bond offering to finance city-owned capital projects that need not be carried out by the public sector at all. An example of such an inappropriate city investment would be a supermarket, an auto dealership, or any other market-oriented endeavor for which there is no clear economic justification for direct public involvement. In such instances, the city would be needlessly playing the role of an equity investor, when there would be no reason to divert limited public loan funds from other uses that themselves could never qualify for private financing.

Another example would be the on-lending of municipal loan funds to profit-making activities that might be partially privately owned. In such instances, the city would be supplanting the function of a private bank. In contrast to the criteria by which capital projects would be evaluated in the public sector, the city's prospective capital projects apparently would presumably be assessed largely on the security of the city's loan to the project (the likelihood that these re-lent funds will be repaid) and on the likely profitability of each project (with perhaps higher re-lending rates imposed upon the presumably more profitable projects). Interest rates to be paid by individual projects might vary, above or below the rate paid by the city, in accordance with criteria to be chosen by the city. Such re-lending activities would involve inappropriately risking public monies for loan repayment in the hope of earning a "spread" between the interest cost of the municipal loan and the interest rate that may be charged to a promising project.

Rather than seeking to play the role of a lender or of a private sector investor, a municipality should seek to function as a public sector investor. Funds borrowed on the open market should be allocated to fully public sector purposes. Capital funding of this sort should be allocated to first to public projects offering the greatest returns, or benefits, to the community.

In that regard, the city may wish to look to infrastructure projects as a part of its portfolio

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ous projects, interest group advocacy, etc.), and various types of project risk.

of projects to be financed. Whether or not they are fully self-financing, infrastructure projects serve essential public purposes that cannot generally be provided through the private market.

## **REVIEW OF PROJECT SIZE AND SCOPE**

It is often very useful to review the size and scope of the specified project once it has been selected for multi-year financing. This review should better be seen as a general review of the scope and character of the project, rather than an engineering review of project specifications.

A general review of the nature, scope, technology, etc., of the proposed project is especially important with projects that were not designed in the last year or so. Major increases in energy costs alone could easily convert a formerly promising project into a potential financial disaster for the city and/or its municipal enterprise. Moreover, technical innovations that were unknown to the central design institutes only a few years ago may well offer much greater operating efficiency than did the original design. Even if the original technology is to be incorporated, the staging of a project over several years, as noted above, might well make the initial project loan significantly more affordable.

Significant economies may be incorporated into the selected project by reviewing its nature, scope, technology, costs, timing, interrelatedness to other projects, etc., before doing a financial analysis of anticipated project outcomes. Any reductions in proposed project cost will translate into lower levels of regular loan repayments, thereby making the entire enterprise more affordable for the city. In a sewage treatment project, for example, it might be possible to construct only that portion of a planned facility that would be needed immediately, perhaps delaying for some years the completion of additional capacity that might be required in a decade or so but for which no expenditures need be made now. Such subsequent construction might then be partially paid for through the contributions of new industrial firms not now foreseen, or the cost of financing might well be lower in the future.

Reviewing the nature and scope of the proposed project also permits a fresh look at the possibilities for generating additional revenues from the project itself. Depending upon the nature of the project, such additional revenues could arise (a) from totally new user fees or charges (as with a toll bridge that had been free of charge before its reconstruction), or (b) from tariff reform of the previously existing schedule of fees and charges (as with higher charges for access to the clean water produced by a new water purification plant). The rationale for tariff reform is discussed below in conjunction with financial analysis of a prospective project.

## **PROJECT FINANCIAL ANALYSIS**

### **Computer Software for Infrastructure Finance Analysis**

The above considerations notwithstanding, the primary component of the technical assistance provided by the Infrastructure Finance team is a financial analysis of the proposed project. This analysis highlights the city's ability to repay the proposed project loan, so as to help the city decide whether it can afford to undertake such a loan for the prospective project.

Our own financial analysis package offers a wide range of alternatives from which to choose in structuring a prospective project loan. It was specifically designed on an Excel spreadsheet for this particular infrastructure finance application, and we have modified and improved the package as we have learned more about the borrowing needs of Russian municipalities.<sup>20</sup>

### A Simple Hypothetical Example: Some Basic Elements Affecting the Debt Burden

Tables I and II present a simple example of one such financial analysis, based on a 20 billion ruble bank loan to a hypothetical municipality. During year 1 of the project, the municipal budget is assumed to be 130 billion rubles, and the budget of the municipal enterprise for which the project would be constructed is assumed to be 10 billion rubles.

Table I, Debt Financing, specifies a wide range of variables that may affect the financial outcomes.<sup>21</sup> Each of the variables listed in Table I can be specified to fit individual economic, financial and project circumstances. These variables are presented in several groupings:

**Project features.** These project characteristics include project cost, construction period, anticipated savings as a result of the project, and anticipated additional operating costs as a result of the project.

**Proposed loan characteristics of a project bank loan or municipal bond.** These items include the principal amount, term of the loan in years, payments per year, real interest rate (the nominal interest rate that is quoted on a loan, plus the existing inflation rate), spread (here, that fraction of the nominal loan rate which, if subtracted from the nominal loan rate, will equal the lower interest rate being paid on construction fund deposits<sup>22</sup>), and whether or not interest earned on construction

<sup>20</sup> Although any such financial calculations of loan repayments are, of course, based on standard financial formulas, many different approaches are possible. Several software programs may be purchased commercially for this purpose, and most financial advisory firms (such as those that advise cities on the issuance of a municipal bond) may also have devised their own financial analysis software.

<sup>21</sup> So as to facilitate its use, Table I is presented in both Russian and English, as are all the output tabulations in the spreadsheet. The presentation of particular tabulations of financial outcomes, such as Table II, can easily be drawn up in either language.

<sup>22</sup> The nominal loan rate (LR), the construction fund deposit rate (DR), and the spread (S) are related as follows:

$$LR (1 - S) = DR$$

Thus,  $LR - (LR \times S) = DR$

fund deposits is to be applied to debt repayment.<sup>23, 24</sup>

**Other revenues.** These items allow for a specified tariff increase (as a percent of revenues), including the period during which it would apply and any delay in its imposition (allowing time for project completion, after which customers would begin to receive benefits from the project).

Projected *ruble inflation rates* and *ruble-US dollar exchange rate*.<sup>25</sup>

Building upon the project and loan characteristics specified in Table I, financial outcomes for *six different project financing formulations* are compared in Table II. These may be seen as items 1 through 6, as enumerated down the left side of the table. Each alternative project financing formulation is arrayed across the table. The simplest formulation (1. NO LOAN) appears at the top of Table II, and the most complex formulation (6. ALL THREE ADDITIONAL FINANCIAL MEASURES) appears at the bottom of Table II:

1. **NO LOAN.** If there is no loan, project cost to be paid in year 1, from current city budget only;
2. **BASIC LOAN.** The basic loan will be repaid, with no additional financial measures to be applied to loan repayments;
3. **PROJECT SAVINGS.** Project savings (initially, 1 billion rubles in year 1 prices) will be applied to loan repayments, to begin at the end of the 3-year construction period;
4. **CONSTRUCTION FUND INTEREST.** Construction fund interest will be applied to

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Therefore,  $S = (LR - DR) / LR$   
or,  $S = 1 - (DR / LR)$

Thus, If LR = 60 percent and DR = 40 percent, S = 33.3 percent:  
 $S = 1 - (0.40 / 0.60)$   
 $S = 1 - 0.667$   
 $S = 0.333$

<sup>3</sup> A construction fund is a common arrangement whereby interest is paid on funds borrowed but not yet disbursed for project expenses.

<sup>4</sup> Although the example illustrates the case of a purely domestic loan, the spreadsheet also contains an international loan component dominated in U.S. dollars, that can calculate a loan with any desired ruble-dollar mix. For example, calculations for both a 3-year, 20R domestic loan could be combined with a 12-year, \$17.9 million (roughly 100R billion) loan from an international donor agency, in order to include international participation with a longer-term loan that is better suited to infrastructure capital finance.

<sup>5</sup> The spreadsheet program also allows for the specification of foreign exchange rates, if there is to be an international loan component dominated in U.S. dollars.

loan repayments;<sup>26</sup>

5. **TARIFF SURCHARGE.** A tariff surcharge (set at 10 percent of municipal enterprise revenues) will be applied to loan repayments;
6. **ALL THREE ADDITIONAL FINANCIAL MEASURES.** Finally, all three additional financial measures together will be applied to loan repayments.

Table II also shows the various repayment outcomes that are associated with each of the above project financing formulations. In the first three data columns on the left side of Table II ("Gross repayments, without additional financial measures"), amounts are given for annual principal payments, interest payments, and total debt service. Respective reductions from these gross repayments, corresponding to each individual financial measure -- application of construction fund interest to debt payment, netting out of any revenue from project savings, and tariff surcharge that may contribute to loan repayment -- are shown in the three columns in the middle of the table (under "Less: Additional measures that may contribute to loan repayment"). Finally, the far right-hand column summarizes the net loan repayments (after reducing total loan repayments by contributions from construction fund interest, net revenue from project savings, and revenue from any tariff surcharge) -- expressed as a percent of city budget revenues. This final data column, therefore, indicates the relative burden of each alternative project financing formulation on the city budget.

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<sup>3</sup> For illustrative purposes here, the interest rate paid on the construction is arbitrarily set at 50 percent below the nominal interest rate or itself.

The results of each of these six alternative project financing formulations may be summarized from Table II as follows:

1. **NO LOAN.** The "net repayments" column shows that paying for the 20 billion ruble project solely from current budget funds would absorb 15.38% of city budget revenues during year 1.
2. **BASIC LOAN.** Taking only the 3-year basic loan, the year 1 repayment would be nearly as much (14.91%) as without any loan, although repayments would significantly diminish in years 2 and 3.
3. **PROJECT SAVINGS.** Project savings does not affect loan repayments, but it does generate meaningful savings that begin as soon as the project is implemented.
4. **CONSTRUCTION FUND INTEREST.** Construction fund interest would greatly reduce net repayments in all three years, cutting the repayment burden to only 9.41% in year 1, with commensurate reductions in subsequent years.
5. **TARIFF SURCHARGE.** The modest tariff surcharge would also reduce the net repayment burden, but only by less than 1 percent from that of the basic loan.
6. **ALL THREE ADDITIONAL FINANCIAL MEASURES.** All three additional financial measures, taken together, would dramatically reduce the net repayment burden -- to 8.65% for year 1, which is 42 percent lower than that of the basic loan.

The list of variables in Table I indicates the wide range of combinations of project and loan characteristics that may be specified for each individual situation. Similarly, the format of financial outcomes, such as those shown in Table II, may be designed in whatever manner best suits each individual circumstance.

### **Tariff Reform: A Special Concern**

One topic deserving special attention here is tariff reform, which, as shown, is easily modeled in our financial analysis package. In the Russian municipal context, tariff reform would rationalize the schedule of user charges for a public service (heating, water-and-sewer service, etc.) so as to raise tariff levels for a particular utility closer to the actual cost of providing that service.

Tariff reform is justifiable from the perspective of both current expenditures and capital expenditures. In terms of current expenditures, many communal services in Russian municipalities are presently recovering no more than 30 percent of their reported operating costs. So as to reduce this burden on municipal budgets, it is therefore desirable to consider tariff increases that would improve the overall level of operating cost recovery. In terms of capital expenditures, moreover, it is reasonable that future consumers of long-term project

benefits would also contribute commensurately to paying the costs of the project that provided them with such benefits in the first place.

Accordingly, all or part of a prospective tariff increase could be allocated to repaying at least a portion of the project loan. Even modest tariff increases could contribute to the repayment of a city's loan repayment burden on an urban infrastructure project.

### **An Example of Project Formulation: Cash Flows Under Alternative Financing Scenarios**

This example illustrates how cash flows may vary under different project formulations, and how the resulting financing requirements may be affected. Unlike the analytic examples that follow, the focus here is on establishing the most desirable net project financing requirement, given certain assumptions of the nature of the project itself. Later examples will show how the various elements of project financing (subsidies, grants, tariff increases, loans, etc.), when taken together, may or may not make a project financially viable.

A Russian municipality that was considering the phased redevelopment of a multi-parcel, near-downtown residential area wished to know if its plans for the project were financially realistic. Our Infrastructure Finance team was asked to review the analytic basis of the city's proposal, because an important aspect of the plan was the extension and rebuilding of water-sewer mains through the heart of the project. Our analytic work sought to conform as closely as possible to the city's original format, so as to make the work easily understood by city officials, while suggesting modified approaches where necessary.

The city's final version of the project proposed to redevelop 668,000 square meters of residential land on 16 separate city blocks ("plots") located close to an important, growing downtown commercial district. The project would sell, at auction, long-term land rights to private developers. The 1,689 families that were currently resident in the area would be relocated from their existing dilapidated quarters to new quarters to be built elsewhere in the city. Except for selected sites that were of important historical, governmental, or commercial value, the land in these 16 plots would then be cleared by the developers, who would build new residential dwellings to replace all the former dilapidated residential buildings. The city anticipated that revenues largely from the sale of these land rights would cover all necessary project costs (predominantly, costs of resettling the existing residents).

The analytic work was derived solely from the city's initial financial estimates for the project. Table III summarizes these projections of revenue (primarily receipts from sale of land rights) and expenditure (primarily resettlement costs: the cost of new housing for current residents of the project area) for each plot in the project area, using the November 1996 exchange rate of 5,500 rubles per US dollar. The city's initial cash flow scheme (Table IV), with its somewhat lower exchange rate, also includes all remaining items of additional project cost that could not be allocated to individual plots within the project area. That cash flow format, updated with the 5,500-ruble exchange rate, was then modified (Tables V and VI, all variants) to derive needed net project financing: project revenues minus project expenditures,



less any specified budgetary contribution.<sup>27</sup>

Several variants of the city's proposed project were examined to see if net financing requirements might rise under alternative project implementation schemes, or with lower prices for land rights. First, alternative project implementation schemes included the original 3-year project (Table V-1), extension of the project through a fourth year (Table V-2), extension of the project through a fifth year (Table V-3), and 3-stage implementation of the project (Table V-4). The best outcome here was shown to be the city's original scheme for a single auction of land rights in year 1, with implementation over three years. Second, assumed prices for land rights were set at 25 percent below the city's initial estimates. Even though this very conservative assumption generated substantially lower revenues, the analysis showed that the city's best approach would still be its original 3-year implementation with a single land auction at the outset. Thus, the testing of both implementation arrangements and revenue sensitivity tended to support the city's overall approach to the project itself.

Loan repayments were calculated for needed project financing of 25,671 million rubles, or \$4,667,498, as derived in Table V-1 (see bottom two rows). As noted in the preceding paragraph, this project size represents the city's most advantageous approach. It also corresponds to the city's original scheme, as calculated in our format with the up-dated exchange rate. These calculations were made on the basis of a hypothetical 5-year loan, at US-dollar interest rates of both 10 and 14 percent. At the city's request, this analysis was done as an approximation of a Eurobond loan based on a straight serial bond, with equal annual payments of principal (in those years when principal was to be paid), except in the case of a balloon payment, where all principal would be paid at the end. As shown in Table VII, annual ruble devaluation rates of 10 percent were assumed, and calculations were based on 1996 constant dollars. Indicated interest amounts were recorded in the year during which they were accumulated (even though they would technically be made on the first day of the next year). As indicated, an issuance fee of 3 percent of the \$4,667,498 project financing requirement was included as a presumed cost of arranging for such a loan. The resulting \$140,025 issuance fee (shown in the left-hand data column of Tables VIII-1 and VIII-2) was added to the net project financing requirement, to be paid to the appropriate parties immediately after the borrowed funds would be made available to the city.

Finally, Tables VIII-1 and VIII-2 show projected repayments of this \$4,807,523 loan, calculated with grace periods (during which there is no repayment of principal) of 0, 1, and 2 years, and the with a balloon payment of the principal at the end of the 5-year loan. Comparison of the bolded total payment column of Table VIII-1 with the cash flows of Tables V-1, V-2, and V-3 shows that such a 10-percent, 5-year loan with a 2-year grace period could be managed in this situation. However, similar comparisons of a 10-percent, 5-year loan with a balloon payment are less promising, since total required repayments of 61,188 million rubles exceed the projected total surplus (Tables V-1, V-2, or V-3) of 53,768 million rubles. The

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<sup>27</sup> Thus, total revenue and expenditure data from Table I (312,601 million rubles and 198,230 million rubles) were carried forward to lines 060, respectively, of Table III-1 and beyond.

repayment picture worsened with an interest rate of 14 percent rather than 10 percent. On the basis of total ruble repayments (Table VIII-2) versus the same 53,768 million ruble total surplus (Tables V-1, V-2, and V-3), total surplus would exceed total ruble repayments only for the 14-percent 5-year loan with no grace period at all.

### **Infrastructure Projects Under Contrasting Local Situations**

More realistic examples of the kinds of financial issues that arise in practice may be seen from our financial analyses of proposed projects in two different Russian cities. Although each of these two projects enjoyed strong support from local leaders, the first of these projects appeared to be financially viable, while the second did not. The first project was moving toward approval by the oblast дума at this writing -- despite continued high bank loan rates -- because strong support from the oblast administration had identified potentially sufficient financial support from additional oblast budgetary contributions and oblast-wide tariff increases.

#### **An Example of Tariff-Increase Alternatives in a Gas Distribution Project**

Prompted by a perhaps chance observation by the Prime Minister of the Russian Federation during a local visit, an oblast administration east of Moscow was eager to proceed with a gasification project that would distribute piped natural gas to previously unserved areas within a single raion.<sup>28</sup> The project generated favorable financial results that depended upon a combination of factors, in which the oblast played an important role. These factors included the commitment of oblast funds (to replace previous oblast subsidies for the residential purchase of bottled gas), two carefully-timed bank loans, and affordable, oblast-wide tariff increases. The tariff increases would make it possible to pay off the bank loans, after which their accumulating additional revenue might continue to be used to help finance subsequent projects within the oblast.

The gas distribution project was an 18.5 billion ruble gasification project, to distribute natural gas within one raion, thereby replacing widespread bottled gas use with a piped distribution system that would expand gas service to previously unserved areas of the raion. This high-visibility project enjoyed the active sponsorship of the oblast administration, significantly because an earlier visit by the Prime Minister had noted that piped natural gas was not yet fully available throughout the oblast. The raion administration, of course, enthusiastically supported the project: The project would provide targeted benefits to this single raion at little cost to its budget, which, in any case, was very largely an allocation directly from the annual oblast budget.

Despite high enthusiasm for the project from both oblast and raion administrations, the financial picture at the outset was not especially promising. The project was originally predicated on an 8-month construction period during a single budgetary year. The raion had

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<sup>3</sup> Russian Prime Minister Victor Chernomyrdin was previously Chairman of Gazprom, then the state natural gas enterprise.

hoped that debt service might be met from new-customer revenues, perhaps plus a reasonable tariff increase within the raion itself. Once the new gas distribution network was completed, the oblast had also hoped to eliminate a 7 billion ruble annual subsidy of residential purchases of bottled gas for heating. Unfortunately, the additional revenues from the new gas consumers in the raion would not have been nearly enough to cover the projected debt service on a one-year construction loan on the full 18.5 billion ruble amount of the project.<sup>29</sup> Even moderate tariff increases within the raion would also not have generated enough additional revenue to meet the repayment obligations on a one-year loan.

Nonetheless, continued discussion with the local authorities produced several additional approaches that helped to improve the overall financial viability of the proposed project.<sup>30</sup> The explanations of these several ideas will be followed by illustrations from the financial analyses themselves.

**Extending the project over a longer period.** A moderate reformulation of the project might greatly improve the financial results. Although it appeared that, in a technical sense, the overall project size could not be reduced, the total amount of borrowing could be cut substantially by extending the borrowing over a period of 4 years, using two different, staggered loans. Thus, an initial single loan for the entire 18.5 billion ruble project was replaced by a proposal for two smaller loans of 3 years each -- one to run from quarters 3 through 14, and a second from quarters 7 through 18. Most subsequent calculations set these 3-year loans at a total of only 7.5 billion rubles (4.5 billion in the third quarter of year 1, and 3.0 billion in the third quarter of year 2).<sup>31</sup> This much smaller overall loan package would dramatically reduce overall interest costs.

**Financial contributions from the oblast as well as the raion.** Despite its interest in phasing-out the annual 7 billion ruble subsidy for residential purchases of bottled gas, the oblast nonetheless considered moderate contributions -- through both its own budget and that of the raion -- that would assure completion of the project. Such contributions would further reduce interest costs, especially if provided precisely when needed during each year's construction activity. As may be seen from Tables IX through XII, financial outcomes were examined for contributions from the oblast budget (4 billion rubles in 1997) and the raion budget (7 billion rubles for 1998, equal to the former oblast bottled gas subsidy), plus either 1 billion from the raion (at the beginning of the second quarter of each loan year, to support each

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<sup>29</sup> This was true even allowing for interest accumulation on the unspent portion of the loan (the construction fund discussed earlier) and a perhaps too-optimistic 60 percent interest rate.

<sup>30</sup> Although each of these ideas afforded the opportunity to move the project forward toward implementation, some of them may be more viable than others from an economic perspective. For example, one of these mechanisms would essentially earmark revenues from a modest-wide tariff increase solely for a so-called "gasification fund," to be used only for future gas distribution projects in the oblast. Although such a fund could certainly raise substantial revenues for future gas distribution projects, another type of project might well offer greater economic benefits. In that instance, these monies would then better be allocated to such an activity, rather than to continued expansion of gas service in the oblast.

<sup>31</sup> Three years is the presumed upper limit of any loan that might be available through a domestic commercial bank during the first half of 1990s.

year's construction: Tables IX, X, and XII) or a minimal alternative one-time raion contribution of 0.5 billion rubles (Table XI).

**Oblast-wide tariff increases.** In acknowledging the importance of improving gas distribution to the residential population, the oblast was willing to consider a tariff increase, not only within the raion itself, but across the territory of the entire oblast. At first, oblast administration representatives indicated that such a tariff increase should not exceed, say, 8 percent of the then-current tariff level. Given the doubling or even tripling of tariffs in recent years in response to inflation, however, such an increase was soon seen as unnecessarily modest. Accordingly, oblast-wide tariff increases of 10.5 percent, 11.8 percent, and 14 percent were subsequently tested under various financial scenarios (Tables IX through XI).

**Continued accumulation of tariff increases in a special "gasification fund", to be used later for other, similar projects.** In considering an oblast-wide tariff increase, it was noted that a modest tariff increase might even be introduced well before construction began. The growing monies from an immediate tariff increase, if accumulated in a separate account, would reduce the overall borrowing requirement for this project. Thereafter, it was seen that the continued accumulation of revenue from a modest oblast-wide tariff increase would serve as a revenue source to defray borrowing on future infrastructure projects. Even a moderate 8 or 10 percent tariff increase could very quickly accumulate for future use, if these monies were solely dedicated to capital improvement needs and remained sheltered from current expenditure uses. (Note the rapid accumulation of funds beginning in quarter 19 in any of Tables IX through XI.)

Finally, the following chart compares the effects of various levels of tariff increase and annual budgetary contributions, showing how long the tariff increase would have to be dedicated to the initial project, before the incremental revenues could be used to help finance another project. In variants 1 through 3 (from Tables IX through XI, respectively), a full 18 quarters would be required (at various trade-offs between tariff increases and annual local budgetary contributions) before the accumulated monies could then be allocated to a second project.<sup>32</sup> If the full 4 billion ruble contribution were matched with the highest (14 percent) tariff increase, however, as in variant 4 (Table XII), the incremental tariff revenues could be allocated to a second project after only 15 quarters.

Scenario	Tariff Increase	Annual Budgetary Contributions (from oblast and/or raion)	Tariff Increment Dedicated to Project through ____
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<sup>32</sup> Direct contributions to the project from the raion budget may be viewed as trade-offs against oblast-wide tariff increases. Since the project was largely supported by the oblast, this alternative might also be seen as a trade-off between current versus future financing from the oblast.

			Quarter
1	10.5 %	4 billion rubles, 4 years	18th quarter
2	11.8 %	2 billion rubles, 2 years	18th quarter
3	14.0 %	0.5 billion rubles, 1 year	18th quarter
4	14.0 %	4 billion rubles, 4 years	15th quarter

### An Example of Low Revenue-Generation Prospects in a Water Supply Project

The second project, in contrast to the first, was temporarily shelved by the city administration that had proposed it. The necessary tariff increases within the city alone -- unrelieved by any additional funding from the oblast or elsewhere -- were too great to have been politically acceptable.

A smaller Russian municipality hoped to expand and improve its water distribution system by constructing a large water main and attendant smaller pipes and connections, to provide more water to underserved neighborhoods. Total project cost was estimated at 36.4 billion rubles, in 1996 rubles. Under all variants, inflation was assumed to diminish from 20 percent, and the lending rate to diminish from 65 percent, in year 1.

**City tariff increase to finance all proposed borrowing.** The initial analysis portrays the municipality's original aim to avoid making any budgetary contributions to the prospective project. Accordingly, the first analysis proposed to finance the cost of the project entirely through bank loans that would be repaid by whatever tariff increase was necessary to meet the total repayment schedule. Table XIII shows that six 3-year bank loans of between 6.35 and 7.67 billion rubles, taken in consecutive quarters beginning in quarter 1, would meet this requirement, but at a tariff ("actual revenue increase, %") that was 320 percent *higher than* the previous tariff (i.e, the new level would be *over four times* the former level).<sup>33</sup> Although the existing local tariff was only about half that of comparable communities, municipal leaders were surely not willing to consider any such dramatic tariff increase as the price of the project.<sup>34</sup>

### Two year of maximum possible city budgetary contributions, plus tariff increase in

<sup>3</sup> The term "tariff" is used here rather loosely. Strictly speaking, the "tariff increases" that are referred to here are actually changes in water-sewer enterprise proceeds from population (residential customers only): The city had requested that any tariff increases be limited to residential customers. (Many industrial enterprises were already substantially in arrears for water-sewer charges, and the cross-subsidy approach had already imposed water-sewer tariffs on both budgetary and industrial enterprises that were substantially higher than those for residential customers.)

<sup>4</sup> As in the above examples, the bar chart portion of the graph -- representing net deposits from additional proceeds from population -- reaches a low point, but still positive level in the first quarter after the initial loan was fully repaid.

**advance of construction.** In the second analysis (Table XIV), the needed tariff increase was trimmed substantially through a different mix of four 3-year bank loans that incorporated several prospective alternative financing arrangements. First, the maximum possible city budgetary contributions were posited for 1997 and 1998 (6.4 billion rubles and 8.2 billion rubles, respectively). Second, funds are accumulated by introducing the tariff increase a full year before construction begins. This produced a still-substantial 146 percent increase above the former tariff level. The effects of these adjustments are easily seen in Table XIV, where the balance on deposit accumulates to over 15 billion rubles (in quarter 7) before loan repayments reduce them to less than half-a-billion rubles (in quarter 18).<sup>35</sup> Thereafter, the accumulating funds from the 146 percent tariff increase grow rapidly as loan repayments decline, replenishing the infrastructure investment fund for future capital projects.

**Three years of smaller city budget contributions, tariff increase coincident with construction.** Finally, a third analysis of seven 3-year loans (Table XV) was proposed, extending the construction period to two-and-a-half years in an attempt to reduce annual outlays. This variant eliminated the proposed construction lag (intended to accumulate funds from the tariff increase), because the city did not want to delay the start of construction. It also cut the city's annual budgetary contributions to 3.8 billion, 4.3 billion, and 4.9 billion rubles over successive years (about half their 1997 real levels). Given the uncertain state of municipal finances, these prospective city contributions seemed more reliably assured than had been the maximum contribution levels over the shorter two-year period. Unfortunately, this variant produced a higher required tariff increase -- 180 percent -- than had the shorter construction period with a prior accumulation of tariff funds.

The resulting 180-percent tariff increase of Table XV, or even the 146-percent tariff increase of Table XIV, remained well above a politically acceptable level. Thus, the municipality chose not to seek bank financing for this project. Although the outlook for project financing and loan repayment improved through these successive analyses, local leaders remained uncomfortable with all prospective combinations of city budgetary contributions and prescribed tariff increases. Their reluctance to proceed is understandable in light of the great uncertainty over future municipal revenues. Their caution is reinforced by the usual concern of municipal leaders about any proposals to substantially raise tariffs for communal services. Even with relatively low local tariff levels, any prospective increase of more than 100 percent in local water-and-sewer tariffs would still likely have generated a strong, adverse public reaction -- especially in this community where the local employment and earnings situation has remained reportedly rather bleak.

## DATA REQUIREMENTS FOR ANALYZING A LOCAL INFRASTRUCTURE PROJECT

To carry out the above sorts of project reviews and financial analyses, information is

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<sup>35</sup> The last column of tabulations provides the exact value of these cash accumulations.

needed both on the prospective project and on financial circumstances of the municipality and its municipal enterprise for which the project would be implemented. Accurate, comprehensive and complete information, of the types outlined here, can greatly inform and hasten the financial analysis of the proposed project. Such financial analysis determine under what conditions the proposed project would be financially feasible. Subsequent discussions can then focus on the best ways to borrow the needed funds.

Table XVI provides a general guide for assembling the needed information on the project, the municipality, and the municipal enterprise. Such a listing can be only a basic outline of the needed information. Nonetheless, it provides a fairly complete picture of the type and quality of information that is needed for a comprehensive assessment and analysis of the proposed project and its prospective multi-year financing.

**Table XVI**  
**Basic Information Needed for**  
**Design Review and Financial Analysis**  
**of a Local Infrastructure Project**

Item	Description or explanation of item
<b>Project description</b>	
Purpose of the project	Example: To provide piped drinking water to 2,900 households in micro-raion X.
Description, size and location of the project	Example: Construction of a 5.2 kilometer water main and associated distribution network to supply treated water from city Water Treatment Plant Number 2 to micro-raion X, including all necessary water lines to pass in front of individual residential buildings, but excluding any connections/hook-ups to individual buildings themselves.
Indicators of improved public service output	Examples: * Increased gigacalorie output of heat * Measurably cleaner drinking water * Measurably lower river pollution
Identification of project beneficiaries	Direct benefits: * Number of additional customers served (by type: residence, business, etc.) Indirect benefits: * Example: Potential future expansion of downtown commercial activity as result of greater availability of heat
General contribution of project to the city	Example: The project will provide treated drinking water to a growing micro-raion that not now reached by the city's existing water network. The project will enable on-going new housing construction to be completed and occupied on schedule.
<b>Alternative project formulation(s)</b>	
Possible completion of project in stages	Identification of components of proposed project whose construction might economically be delayed for some years



Possible reduction in project size	Identification of possibly smaller alternative project formulation(s)
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Table XVI, continued

Item	Description or explanation of item
<b>Project financing</b>	
Project cost	Overall project cost
Source of project funding	Proposed financing breakdown: * Loan funds * Budgetary contributions, from: -- Municipality -- Oblast (including raion/oblast funds) -- Higher authorities (if any) * Revenues from tariff reform (see separate section below) * Revenues for possible one-time assessment fee or connection/hook-up charge
Proposed borrowing	* Size of loan * Type of loan: -- Bank loan -- Municipal bond issue -- Eurobond issue -- Other * Anticipated terms of proposed loan: -- Interest rate -- Repayment period -- Grace period (if any) -- Issuance fee -- Other
Schedule of construction spending	* Optimal construction period * Possible re-scheduling of construction to smooth loan repayments
Additional operating or maintenance costs of project	* Energy * Labor * Additional tools and equipment * Administration * Other
Potential cost savings	* Energy * Labor

	* Other
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Table XVI, continued

Item	Description or explanation of item
<b>(Project financing, continued)</b>	
Possible tariff reform	<ul style="list-style-type: none"> <li>* Prospective magnitude of tariff increase</li> <li>* Base of tariff increase: <ul style="list-style-type: none"> <li>-- All customers</li> <li>-- Only residential customers</li> <li>-- Other</li> </ul> </li> <li>* Jurisdiction (geographic area) of tariff increase: <ul style="list-style-type: none"> <li>-- Boundary of direct benefit area</li> <li>-- Entire municipality</li> <li>-- Entire oblast</li> <li>-- Other</li> </ul> </li> </ul>
<b>Borrower creditworthiness information</b>	
Municipality	<ul style="list-style-type: none"> <li>* Budget plans and outcomes for previous 3 years</li> <li>* Budget plans for next year</li> </ul>
Municipal enterprise	<ul style="list-style-type: none"> <li>* Budget information: <ul style="list-style-type: none"> <li>-- Budget plans and outcomes for previous 3 years</li> <li>-- Budget plans for next year</li> </ul> </li> <li>* Operating information: <ul style="list-style-type: none"> <li>-- Physical output of production or service</li> <li>-- Physical volume of billed service</li> <li>-- Assessment of systemic losses or leakages</li> </ul> </li> </ul>
Tariff history	Tariff history for previous 3 years, by class of customer
Arrearages and outstanding debt owed to municipal enterprise	<ul style="list-style-type: none"> <li>* For previous 3 years, by class of customer</li> <li>* For each major local industrial enterprise with a history of arrearages</li> </ul>
Other outstanding debts of municipality and municipal enterprise	<ul style="list-style-type: none"> <li>* Current debt obligations <ul style="list-style-type: none"> <li>-- Amounts</li> <li>-- Repayment schedule(s)</li> </ul> </li> <li>* Repayment performance on past debt obligations</li> </ul>



## PROJECT FINANCING

### Aspects of Project Financing

#### *Loan Documentation and Municipal Creditworthiness*

In a municipality's discussions with potential lenders, the city should make the most of its advantages in the competition for funds. If the city makes a strong case for the proposed project and loan, lender interest in making such a loan will increase. If the city makes its case to several lenders, not just one, the resulting competition among lenders could significantly improve the terms of the loan. Interest rates might be reduced, the loan period might be extended, a higher rate might be offered on construction fund interest, a grace period might be introduced in repayment of loan principal, etc.

Good loan documentation is important in seeking a loan, especially in approaching a lender with which the city has not done business before. Such situations will become increasingly common as banks become more interested in municipal lending. Table XVI provides a sound basis upon which to good documentation may be built.

A record of creditworthiness is important in seeking all future loans. In addition to good documentation, an established record of the city's history of timely repayment of any previous loans will increase lender confidence that future loans will be fully repaid on time. Many municipalities borrow simply for cash flow purposes during a current year. However, a multi-year capital improvement loan can be more of a challenge to both borrower and lender alike, since it obligates repayment from a sometimes less-predictable flow of future revenues. In that regard, even a small multi-year loan can begin, or add to, the accumulation of just such a record of municipal creditworthiness. Once a good repayment record has been established with one such loan, it is easier for the same lender -- or different lenders -- to consider an even larger multi-year loan.

#### *Competitive Offers Produce the Best Loan Terms*

Before discussing the several different forms of multi-year municipal financing, it is worth emphasizing the importance of using competitive market forces of obtain the best possible loan terms for either a bank loan or a municipal bond.

In considering multi-year bank loans, municipal officials often seem to prefer to deal only with the one or two banks from which they have acquired short-term loans in the past. This is natural and understandable, as it ensures familiar working relationships and, it is hoped, a favorable reception to the city's proposal. It does not, however, ensure that the forthcoming loan, if offered, will carry with it the best financial terms for the city.

The best terms can generally be established only by shopping around to different potential lenders, making no secret of the city's intention to find the best possible terms before

closing the deal. One bank may offer a lower interest rate, a longer loan period, a grace period on repayment of principal, better arrangements for the construction fund, etc. Alternatively, the city might well solicit such improved terms. If such better terms are proposed by one lender, the municipality can simply ask other, competing lenders to match, or better one or more of these terms.

Although this procedure might put pressure on the previously warm relationships that may have existed between the individuals represent the city and its potential lenders, all parties must recognize that the city's ultimate interest is in acquiring the most affordable terms on the prospective loan. Once the lenders acknowledge that perspective by their continued participation in the competition for the city's loan business, good relations will generally proceed as before.

This principle of competitively seeking the most affordable arrangements for the prospective loan applies equally to bank loans and to municipal bond offerings. The city's "regular" bank may be the most familiar, but better terms might be offered by other local banks or even by banks located elsewhere, perhaps as a means of expanding their business to a new municipal customer. The same may be said of the various financial advisors who would assist the city in issuing municipal bonds. Lower commissions might be negotiated from some municipal bond placement agents, for example, or a more efficient legal advisor might well be able to do the needed work more quickly for lower overall cost.

## **Structure of Financing**

Important considerations in structuring any debt issue include the period of the loan and the maturity schedule. With bonded debt, the type of bond itself is also relevant.

### *Types of Municipal Bonds*

A municipal bond is a debt obligation of a level of government below that of the central government. In the West, the borrowers may be state or local government entities of various kinds. In Russia, municipal bonds might be issued by municipalities themselves, or by oblasts. The funds may support general government needs or particular projects. In general, a bond is any interest-bearing or discounted government or corporate security that obligates the issuer to pay the bondholder a specified sum of money, usually at specific intervals, and to repay the principal amount of the loan at maturity.

Municipal bonds are generally divided into general obligation bonds and revenue bonds. A hybrid, referred to as a double-barrelled bond, combines the features of the other two types.

A general obligation bond is backed by the full faith and credit of the municipality (or other borrowing entity). This means that the full taxing power and further borrowing power, plus revenue other than taxes, is pledged in payment of interest and repayment of principal of

a bond issued by a government. A general obligation bond is repaid with the general revenue and borrowings of the issuing government.

In contrast, a revenue bond is issued to finance public works, such a sewer system or gas distribution pipeline, and is supported directly by the revenues of that project. Strictly speaking, revenues collected from users of such facilities are to be committed to paying off the bond. Unless otherwise specified, bondholders have no other claims on any other resources of the issuer.

So-called double-barrelled bonds are a combination of general obligation and revenue bonds. Double-barrelled bonds are backed first by revenue streams from the project being financed. Should those revenues prove inadequate to fully service the debt, they are also backed by the general taxing and further borrowing power of the local government issuer. Double-barrelled bonds would thus appear to carry lower risk than either general obligation or revenue bonds, and they may be expected to offer somewhat lower interest rates to reflect this lower risk.

#### *Period of the Loan*

Multi-year financing of infrastructure projects permits the costs of a long-term capital project to be recouped across the project's full useful life -- with all future beneficiaries paying their fair share of these costs in accordance with the benefits that they may indeed receive at that time. In keeping with the long-term nature of the capital improvement, the period of the project loan -- the length of time for which the principal is borrowed -- may thus extend several years into the future. It should not, of course, exceed the useful life of the project itself.

In Russia today, the reverse situation is the problem, in that loan money is not available for nearly as long a period as the useful life of the project. Although infrastructure projects may have useful lives of 20-to-50 years or more, infrastructure project financing in Russia is generally available for no more than 2-to-3 years from domestic commercial banks, perhaps for five years or so from Eurobonds and domestic municipal bonds (though the latter's tranching arrangements may also limit a lender's actual period of exposure), and for perhaps 10 years or so even from the World Bank.

#### *Maturity Schedule*

The maturity schedule -- on what date or dates the principal is to be repaid -- should depend on the availability of the revenues from which the principal repayments are to be made.

With general obligation bonds, for example, regular municipal budgetary revenues generated over the course of a year are the usual source of payment. General obligation bonds are thus most often structured as serial bonds, where a portion of the principal comes due for repayment annually (or perhaps semi-annually) over the life of the bond. Straight



serial bonds feature level principal payments, with total annual debt service declining over the life of the bond as principal is paid off. Serial annuity bonds, in contrast, feature level total debt service over time.

With revenue bonds, debt repayments should correspond to the flow of revenues from the project. Accordingly, debt repayments must often be delayed until after the project has been completed, once planned project benefits have begun to generate net additional project revenues from which loan repayments may then be made. This may require a formal grace period on the loan, wherein repayment of principal might not begin for one or more years after the loan was made.

In contrast to serial bonds, principal repayment in term bonds (such as Eurobonds) is delayed until maturity -- in a so-called "balloon payment" -- although interest payments may be made annually or semi-annually. A sinking fund may be employed with term bonds, in which regular deposits into the sinking fund will accumulate the needed amount by the time the final debt repayment is due. Even without the regular formal repayment of the debt, therefore, a properly-used sinking fund mechanism imposes much the same repayment discipline on the borrower as does a serial bond.

#### *Repayment Sources, Loan Guarantees, and Collateral*

As noted earlier, the most desirable source of loan repayment would be a dedicated incremental revenue stream from the new project that, alone, would be sufficient to fully repay all interest and principal obligations on time. Short of that, as noted in the preceding examples, a portion of the required regular debt service payments might well be raised as a result of tariff reform that at least moves toward more fully covering the overall costs of service provision.

Lender confidence can also be enhanced through several other means. These include use of other dedicated revenue streams, the granting of loan guarantees from one government entity to cover loans taken by another, or by use of borrower property as collateral.

First, in addition to the commitment of specific project revenues to debt service, other revenue streams may be dedicated to loan repayment. For example, if the borrower were a municipal enterprise itself, a specified percentage of the *total* annual revenue of the enterprise itself might be pledged to repayment of the obligation. As incentive for repayment as well as assurance to the lender, moreover, the penalty failing to make a regular payment might then be defined as a doubling or tripling of that percentage for the period of the default. Alternatively, a municipality might dedicate all or a part of revenues from another, recognizably reliable municipal revenue source, to repayment of a municipal enterprise's loan obligations. If from a well-established revenue source, such assurances could function in much the same way as a municipal loan guarantee, but without the formal obligation.

Second, formal loan guarantees might be granted by one government entity to cover the obligations of another, probably subordinate, government. Thus, a municipality might guarantee the repayment of loans undertaken by one of its municipal enterprises, or an oblast

might guarantee a loan undertaken by a city within its jurisdiction. In a variant of this, of course, an oblast might undertake a loan obligation itself, only to pass on most or all of the proceeds from the loan to selected municipalities and raions under its jurisdiction.

Third, separate property of the parent municipality might be offered as collateral on a loan to a municipal enterprise, the assets of which (sewer pipes, heating stations, water treatment facilities, etc.) often have little value other than in their function as communal enterprise property. Other municipal property, such as a cinema, might then be offered as collateral on a loan.

### **The Bond-Issue Process**

The process of issuing bonds is basically the same for both domestically-issued municipal bonds or for Eurobonds (each of which will be discussed in the following section).

Underwriting is the foundation of this issuance process.<sup>36</sup> Strictly speaking, to underwrite an investment is simply to buy a new issue of securities from the issuer (for our purposes, from a municipality or oblast) and then to resell these securities to the public (to physical as well as legal entities), either directly or through dealers. The underwriter seeks to make a profit (the so-called "underwriting spread") on the difference between the price paid to the issuer and the price at which a new issue is offered to the public (the "public offering price"). In exchange for this anticipated profit, the underwriter thus assumes the risk that the entire issue may not be fully subscribed (completely sold) at the public offering price.

Underwriting is done by investment bankers, who usually form an underwriting group (often called a "syndicate"). The syndicate includes enough member banks so as to pool the risk and assure successful distribution of the issue. The underwriting risk is most severe when the underwriter purchases the securities outright from the issuer in a "firm commitment" underwriting (known as a "bought deal"). Various other arrangements might be made whereby the issuer shares the risk with the syndicate. These include "best effort" arrangements and "standby commitments." Under best effort arrangements, investment bankers agree to do their best to sell an issue to the public, as purely as agents of the issuer. (As will be noted below, the common use in Russia of a "placement agent" resembles this approach, but placement agents are only financial marketers and advisors, not banks.) Under standby commitments, a standby underwriter contracts to purchase -- usually at a price lower than the public offering price -- and then resell any portion of an issue that is not subscribed to during the two- or four-week standby period).

The syndicate appoints a managing underwriter (or "lead underwriter," or simply "manager") that acts as agent for the underwriting group. This firm is usually the one that began working with the issuer in the first place -- planning the details of the issue, preparing

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<sup>3</sup> Our summary of the underwriting process draws heavily from John Downs and Jordan Eliot Goodman, Dictionary of Finance and Investments, Hauppauge, N.Y.: Barron's: 1995, inter alia.

the necessary documentation, etc. The managing underwriter signs the underwriting agreement that sets forth the terms and conditions of the arrangement and the responsibilities of both issuer and underwriters. In the West, the manager may also appoint a selling group of securities dealers and the underwriters themselves, to assist in the distribution of the issue.

There are some important differences in the way this process is often conducted in Russia. One of the most important differences is that underwriting, as such, is much less common in Russia. Instead of an underwriter agreeing to purchase and resell the issue, a "placement agent" is more likely to be used in the issuance of a domestic municipal bond. A placement agent would agree to market the issue -- that is, to seek purchase commitments from prospective investors. Placement agents should offer expertise in the marketing of municipal bonds and sufficient contacts within the domestic financial community to do so successfully. However, placement agents generally provide limited financial marketing and advisory services; they are not investment banks. They themselves do not enjoy access to the necessary capital to enable them to enter into purchase contracts with an issuer -- even as members of a syndicate.

Moreover, placement agents and other financial advisors in Russia may not necessarily be selected through competitive bidding, as are underwriters for municipal and public utility bond issues in the United States. In developed financial markets, the best price usually determines the winner among established, reliable bidders whose well-known performance records are not greatly differentiated one from the other. In emerging financial markets, however, the quality and reliability of the various financial service advisors (placement agents and others) often cannot easily be determined; Nor may contending bids necessarily be easily evaluated and compared. This situation can greatly impede the competitive bidding process that would otherwise improve the efficiency and quality of financial services and reduce, over time, the net costs of issuing municipal bonds.

### **Type of Debt Instrument**

Once the financial analysis has indicated the conditions under which a proposed project might be financially feasible, the most appropriate form of financing may then be selected. This may include taking a bank loan, issuing a municipal bond, or even possibly seeking international financing through a so-called Eurobond.

#### *Bank Loans*

Administratively, of course, it is much easier and much less costly to obtain bank loans than to issue municipal bonds. The borrowing process is significantly quicker and more familiar, the uncertainties of actually acquiring the needed funds are resolved much sooner, the administrative arrangements are much easier to understand and anticipate, the personalities themselves are generally more well known to local officials, etc. Municipalities usually obtain bank loans from local banks, with which they already enjoy well-established working arrangements, and whose officers are generally well-known by city officials.

For these reasons, bank loans are generally preferred for the relatively smaller-sized municipal borrowings -- generally up to 20 billion or 30 billion rubles. Larger loans are often difficult to obtain from one, or even a consortium of, banks. Some Russian banks, moreover, are reluctant to consider municipal loans of longer than one year, and many are unfamiliar with the special circumstances affecting capital loans -- as opposed to the relatively common short-term municipal loans used to cover current budget-deficits.

Larger projects are also less likely to rely on bank loans because of their relatively short loan periods. In some instances, however, banks may be willing to renew loans, say, one year at a time. Although such arrangements can provide longer-running project financing, a lender might at any time refuse to renew such a loan. Such a development could create a financing crisis for the city, perhaps resulting in a partly-completed project that is of no value to anyone.

In late 1996 and early 1997, interest rates on ruble-denominated bank loans to municipalities (where available) reportedly remained in the 70-to-80 percent range -- a figure that has essentially not changed during the past half-year. As discussed later in this paper (under "Municipal borrowing in Russia's current macroeconomic environment"), this rate is likely to fall as economic conditions stabilize at a lower-inflation economic environment. In any event, interest rates on either bank loans or municipal bonds of longer than one year's duration may be expected to vary with economic conditions. These interest rates generally move in response to changes in the interest rates paid on Russian Federation bonds (GKO's).

### *Municipal Bonds*

Cities may borrow on the open market to obtain needed long-term capital funds, issuing municipal bonds in the manner that has long been common in Europe and America. Municipal bonds are the usual form of major multi-year municipal borrowing for capital purposes. Municipal bond issues may be designed to acquire the needed funds by attracting the capital of small as well as large investors. As the market matures for municipal debt, municipal bonds also become more attractive because they may be resold on an active secondary market.

Municipal bonds would generally support larger capital borrowings, beginning at about the 10 billion ruble level, and ranging upwards of 100 billion rubles and beyond.

Issuance fees for a domestic municipal bond issue in Russia were estimated in early 1996 to be 3-to-6 percent of issue value for a 100 billion ruble issue and 5-to-10 percent of issue value

for the minimum-sized 10 billion ruble issue. Discussions with several financial service firms indicated the following illustrative components of these costs:<sup>37</sup>

Arrangement of bond issue and preparation of prospectus	2.0%
Registration of the prospectus	0.8
Printing of document forms	0.2
Settlement and depository services	2.0 - 3.0
Placement services	<u>2.0 - 3.0</u>
Total	7.0 - 9.0%

Issuance fees include total fees for managing, underwriting, and actually placing the issue with investors. In the West, these are usually discrete functions that may be carried out by different institutions within a syndicate. In Russia, one institution may function as placement agent for the issue, thereby incorporating each of the major issuance functions under one roof.<sup>38</sup> In the developing Russian market, the percentage amount of the issuance fee might be expected to drop with increasing value of the issue. The issuance fee would also likely fall over time, as cities accumulate records of creditworthiness, as financial service firms come to work more efficiently, and as market competition reduces excess profits in the industry.

Until the beginning of this year, municipal bonds enjoyed a significant advantage over domestic bank loans in competition for multi-year municipal financing. That is, interest earnings on securities issued by Subjects of Federation (including republics, oblasts, and the cities of Moscow and St. Petersburg) had been exempt from taxation, whereas bank profits were, and are, taxed at a 43 percent rate. Since January 1997, however, interest earnings on all municipal bonds are to be taxed at 15 percent for legal entities and at the applicable personal income tax rate (from 12 percent to 35 percent) for physical entities. This change in the tax law should greatly reduce the price advantage formerly enjoyed by municipal bonds over bank loans in the potential financing of multi-year municipal investments.<sup>39</sup>

<sup>37</sup> Cost estimates for issuing municipal bonds in Russia are taken from A. B. Kopeikin, "Feasibility Analysis of Funding of City Infrastructure through Issuing of Municipal Bonds or through Bonds Issued by Subjects of Federation," Moscow: Institute for Urban Economics.

<sup>38</sup> Numerous firms can assist municipalities in various aspects of issuing municipal bonds. These firms include commercial banks (such as Sberbank Credit Bank in Moscow, and others, in Moscow and elsewhere), the finance company Cora in Moscow, or the finance/investment company Renova Invest in Yaroslavl. These firms are identified not as recommendations but only to show that several types of institutions might be found in individual communities.

<sup>39</sup> On a 1,000 million ruble loan with a 50 percent interest rate, for example, a legal entity would now pay a tax of 75 million rubles ( $1,000 \times 0.15 = 150$ ), whereas no tax previously had been imposed. The same-sized bank loan with an identical 50 percent interest rate would generate a tax of 81.7 million rubles, if the average cost-of-funds was 28 percent of the loan amount and if operating expenses were 3 percent of the loan amount (gross earnings of 500, less cost-of-funds of 280, less operating expenses of 30, equals net profit of 190; profit tax of 81.7 million rubles).



## *Eurobonds*

Eurobonds (bonds denominated in U.S. dollars or other currencies, and sold outside the country whose currency is used) have recently attracted considerable interest in Russia as a potential source of public financing. In a subscription that more than doubled initial expectations, the Russian Federation issued \$1 billion in Eurobonds in November 1996, with an interest rate of 9.25 percent, only 3.45 percent over that of U.S. Treasury securities. Municipal Eurobonds were also a great success during late 1996. Buoyed by these results, Moscow and St. Petersburg are expected to seek perhaps \$500-to-\$600 million and \$300 million, respectively, on the Eurobond market this winter. Other municipalities, including Nizhni Novgorod, are also looking to the Eurobond market as a source of multi-year capital financing on generally favorable terms.

Despite these high expectations, only the larger Russian municipalities are likely to successfully acquire substantial amounts of capital through Euroborrowing during the coming months. In the near term, the needed assurance of repayment is likely to discourage investors from all but the larger cities and some other Subjects of Federation, whose name recognition, prominent size, and previous borrowing experience can be of significant value in attracting capital in this way. The larger and better-known cities may be capable of attracting some international funds because of their greater exposure to international business and their growing attractiveness as markets for foreign products and services, and as sites for foreign investment. Most Russian other cities, however, are probably not yet ready to seek longer-term loans from international private sources on a significant scale.

Any Russian municipality that may contemplate the Eurobond market should first consider some of the practical approaches to multi-year municipal borrowing that are discussed in this paper. These approaches should include preparation of realistic capital improvement programming of feasible projects; identification of sufficient project-related revenues to assure timely loan repayment; and preparation of good documentation on the proposed project, loan repayment prospects, and municipal credit history. Indeed, even so well-known a jurisdiction as the City of St. Petersburg is presently seeking to improve its attractiveness in Western capital markets by (a) better organizing and understanding its overall debt burden, (b) arranging for an international-standard audit of the City's finances, and (c) seeking to make the City's budget more transparent.

Costs of issuing a Eurobond include (a) a fee to be divided among the firms that assist with the issue and (b) the reimbursement of expenses in addition to fees and commissions.<sup>40</sup>

Fee structures are expressed as a percentage of the principal amount of the issue. A typical 2 percent fee (the "Gross spread") might be distributed among the managing underwriters (0.375 percent), the sub-underwriters (0.375 percent), and placers of the deal (1.250 percent "selling commission"). Fees increase with

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<sup>40</sup> This material is taken from F.G. Fisher III, *Eurobonds*, London: Euromoney Publications, 1988, pages 69-71.

maturities, to compensate for the greater risk involved: 2.00 percent might be charged on a 5-year issue, 2.25 percent on a 7-to-10 year issue, and 2.5 percent on a 10-year issue. The management fee is divided among the various underwriters in proportion to time spent in preparation of the issue. The underwriting fee -- which is sometimes combined with the management fee -- is allocated to each underwriter according to the proportion of their underwriting commitments. The selling concession is allowed as a deduction from the subscription price to those banks that have been made allotments of bonds.

Expenses are normally partially reimbursed against underwriters' and issuers' additional costs for communications, advertizing, printing, and other identifiable expenses. A \$100 million Eurobond issue might incur underwriters' expenses of roughly 0.10-to-0.15 percent of the value of the issue.

### **Municipal Borrowing in Russia's Current Macroeconomic Environment**

Continued high interest rates and short loan periods remain major impediments to successful multi-year municipal borrowing for infrastructure improvements in Russia. Interest rates on bank loans or municipal bonds have remained in the 70-to-80-percent range since mid-1996. With Russian inflation having fallen markedly, to a 15-to-20 annual percent by the latter part of 1996, such continued high real lending rates reflect Russian bankers' reluctance to venture beyond the safer realms of Russian Federation bonds (GKO). Moreover, despite the influx of foreign money that boosted Russian stocks to record highs at the beginning of 1997, the high real domestic lending rates indicate continued domestic concern about Russia's near-term economic future.

Nonetheless, the macroeconomic interest rate situation has improved steadily in recent months. In early December 1996, the Central Bank refinance rate was again lowered, this time from 60 to 48 percent, presaging a drop in 6-month GKO rates to the low-30-percent range by late January 1997. This was down from nearly 50 percent earlier in the autumn, and way down from the over-200-percent peak in the run-up to the June 1996 Presidential election.

While still markedly high in real terms, the distinctly downward trend of interest rates should augur increasingly well for municipal borrowers during 1997. As shown in Table XVII, Ministry of Finance projections for 1997 anticipated a rough halving of the central bank refinancing rate and the consequent commercial bank lending rate between January and December of 1997.<sup>41</sup> Even should these estimates prove to be somewhat too optimistic, they would appear at this writing to be reasonable indicators of the expected continued improvement in the macroeconomic environment for domestic finance in Russia during the coming year.

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<sup>41</sup> These estimates, which were made in the late fall of 1996, did not fully anticipate the continued fall of GKO interest rates into the low end range by January 1997.





**Table XVII**  
**Ministry of Finance Interest Rate Projections for 1997**  
**(in percent)**

Month	Central Bank Refinancing Rate	Commercial Bank Rates		Average Auction Yields on GKO's*
		On loans	On deposits	
January	55	77	49.5	44
February	50	70	45.0	43
March	50	70	45.0	42
April	45	63	40.5	40
May	45	63	40.5	37
June	40	56	36.0	35
July	35	49	31.5	34
August	35	49	31.5	31
September	30	42	27.0	28
October	30	42	27.0	32
November	25	35	22.5	29
December	25	35	22.5	24

\*Including the new 15 percent profits tax, which was to have come into effect in January 1997.

Source: Michail Gorelov, Leonid Nikiforov, and Valeri Sokolov, "Perspectives for the Development of the Market for GKO/OFZ through the Prism of the Federal Budget", Securities Market Paper, no. 24, December 1996, pages 21-24.

Accordingly, prospects for municipal borrowing for infrastructure improvements should improve during 1997. Diminished yields on GKO's are likely to force domestic banks to revise their portfolios, reducing holdings of the increasingly less-profitable GKO's and, hopefully, expanding domestic lending. The November offering of Russian Federation Eurobonds, and the anticipated success of municipal Eurobonds of Moscow and St. Petersburg, may also soothe Russian banks' concerns about multi-year municipal lending, prompting at least some of them toward more active and more flexible commitments to Russian municipalities.

Finally, of course, these generally diminishing interest rates should also be reflected in

lower interest rates on bank loans to municipalities. Thus, it would not be unreasonable to hope that, by mid-1997, such interest rate reductions may reach a level where bank loans might become a viable option for multi-year infrastructure finance in Russia.

## **CONCLUSION**

The paper has discussed the specification, analysis, and multi-year financing of municipal infrastructure projects. It has stressed the importance of selecting the prospective project from a list of possible projects that have been prioritized according to community needs and resources, relying on officials' qualitative judgments as well as on quantitative information.

Once a project has been tentatively identified for multi-year financing, it is often useful to review its size and scope, seeking to economize on project cost and thereby on the amount to be borrowed. The subsequent financial analysis may then explore ways to reduce the required repayment burden while focusing on the municipality's ability to service the debt. Important considerations here include the likelihood of repaying the loan from project-generated revenues, including those from higher tariffs. Once desirable conditions have been determined for project financial feasibility, the most advantageous loan terms may then be pursued by seeking competitive offers from several potential lenders.

Substantial space has been devoted here to the financial analysis of infrastructure projects. In the course of this project, computer software was designed specifically for infrastructure finance analysis as applied to Russian municipalities and other local governments. These computer programs have been used here to illustrate the sorts of financial analyses that may be applied to municipal infrastructure projects, drawing upon several diverse examples from our work in Russia.

Local officials from Russian municipalities, oblasts, raions, and municipal enterprises are encouraged to examine the various types of financial analysis that are presented here, so as to understand how such work might also be applied to their own infrastructure finance situations. In general, these analyses suggest that promising results may often depend upon creative approaches to the financing of municipal infrastructure, and that narrow reliance solely upon local budgetary sources may not often yield promising results.

Multi-year municipal borrowing for capital projects is a new idea for Russia that may take time to become widely understood and accepted. Long-term municipal borrowing for infrastructure improvements is common in the West. Nonetheless, Russian municipalities often wish to avoid multi-year borrowing for capital projects, hoping instead to cover the cost solely from the current budget. If budgetary funds prove insufficient for this purpose, however, a multi-year loan may be the only way to finance the project and thus obtain its anticipated long-term benefits for both current and future generations.

Unfortunately, generally low rates of cost recovery in many municipal enterprises mitigate against self-financing capital projects, and Russia's long tradition of below-cost provision of communal services also makes significant tariff reform unlikely in the near term. Thus, local officials often seek to avoid those tariff increases that would generate enough

additional revenue for a project to meet its required principal and interest payments. In such circumstances, imaginative use of multiple sources of financing (including oblast-wide approaches to the problem) may ease the repayment burden of an initial multi-year financing of local infrastructure improvements.

The large unmet need for the multi-year financing of infrastructure projects in Russian municipalities cannot forever be ignored, despite the challenge that this new approach may present to Russia's local leaders. Multi-year loans -- from domestic banks, from municipal bonds, or even from Eurobonds -- offer alternative responses to this growing demand for municipal capital finance. This paper has outlined some basic aspects of multi-year borrowing for infrastructure improvements that can help municipalities prepare for, pursue, and obtain such needed capital financing.